

Subject: glowbugs V1 #227

glowbugs

Wednesday, January 21 1998

Volume 01 : Number 227

Date: Mon, 19 Jan 98 13:22:32 MST

From: "Mark Dittmar" <Mark_Dittmar@maxtor.com>

Subject: Transformer question

Hi-

I am trying to construct a 250 VDC @ 130 mA power supply. I have an isolation transformer, 115/115 rated at 35 VA. I would like to voltage double the output of this transformer up to the required 250 VDC. How do I determine if this transformer can handle the job ? 250 VDC*130 mADC = 32.5 Watts, not really the same as 32.5 VA, which holds for AC values of voltage and current, correct ?

What numbers should I be using in my calculations ?

Thanks,

Mark, AB0CW

Date: Mon, 19 Jan 1998 18:05:16 -0700

From: Steve Lords /WA7ISL <sklords@sprynet.com>

Subject: Re: 6146 blue glow

Jan

now that you mentioned it, i remember the magnet test to be safe,tape a magnet on to a long insulate handle and keep one hand in pocket
thanks
steve
wa7isl :)

Jan Axing wrote:

> Steve Lords /WA7ISL wrote:

> >

> > greetings

> > other then a gassy tube, it there any

> > reason why a 6146 has a blue glow

> > when under load..

>

> Stray electrons hitting the glass often causes a blue glow depending
> on the glass quality and is nothing to worry about. It's an indication
> of good vacuum. This can be tested with a magnet, the blue glow will
> move when the magnet comes near. Glow caused by gas will not move,
> gas ions are way heavier than the electrons.

>

> Power tubes also shows a faint blue glow on the inside of the plate
> when drawing current at higher voltages and is also pretty normal.

> If this glow is greenish you may suspect gas. Any other color than
> dark blue is abnormal.
>
> As usual: be very careful when doing the magnet test, reminding of
> the lethal voltages there.
>
> 73
> Jan, SM5GNN

Date: Mon, 19 Jan 1998 21:05:12 -0600
From: mack@mails.imed.com (ray mack)
Subject: Re: Transformer question

Mark:

You are actually quite close to the mark in your initial calculations. In most cases of DC power supplies, the DC power on the output is equal to the VA being used. The reason that transformers (as well as other AC equipment) is rated in VA rather than Watts, is that the heat generated is directly proportional to the current flow (remember I squared times R). If the current and voltage are badly out of phase, the actual wattage consumed can be quite small, but the current can be quite large. This is what is meant by power factor.

The answer to your power supply question may have an unhappy ending. Voltage doubler power supplies are capacitor input so the peak output voltage is related to 1.414 times the RMS value. In the case of a practical voltage doubler you use 2.5 to 2.8 times the RMS value to find the output voltage under load. Your isolation transformer is going to produce on the order of 300 VDC rather than the 250 VDC you want. Under light load and full strength wall voltage, it could go as high as 350 VDC!! In many glowbug applications, the difference between 250VDC and 350 VDC may not be a problem. Additionally, if you use enough resistance in a Pi power supply filter. you may drop the voltage down closer to 250 VDC under load.

You will probably want to watch how hot your transformer gets. You will be very close to the ratings of the transformer and they are rated for a substantial temperature rise when putting out the rated power.

Don't let this discourage you. I am merely pointing out the potential problems. You are close to the edge in this application, but it may work out OK for you. As long as you don't get things so hot they melt the stuff in the transformer, I'd say to give it a try.

Ray Mack
WD5IFS
mack@mails.imed.com
Friendswood (Houston), TX

Reply Separator
Subject: Transformer question

Author: "Mark Dittmar" <Mark_Dittmar@maxtor.com> at mails
Date: 1/19/98 1:22 PM

Hi-

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What numbers should I be using in my calculations ?

Thanks,

Mark, AB0CW

Date: Mon, 19 Jan 1998 21:19:03 -0800 (PST)
From: Ken Gordon <keng@uidaho.edu>
Subject: Re: Transformer question

> Hi-

>

> I am trying to construct a 250 VDC @ 130 mA power supply. I have
> an isolation transformer, 115/115 rated at 35 VA. I would like to
> voltage double the output of this transformer up to the required 250 VDC.
> How do I determine if this transformer can handle the job ? $250 \text{ VDC} \times 130$
> $\text{mADC} = 32.5 \text{ Watts}$, not really the same as 32.5 VA, which holds for AC
> values of voltage and current, correct ?

>

> What numbers should I be using in my calculations ?

Use the VA rating as a base. It only becomes significantly different with leading or lagging current-to-voltage sine waves. For your purposes, it is close enough.

Ken W7EKB

Date: Tue, 20 Jan 98 10:50:02 MST
From: "Mark Dittmar" <Mark_Dittmar@maxtor.com>
Subject: Transformer question thanks

Hi-

I would like to thank all of you that responded to my question regarding the use of the isolation transformer for a voltage-doubled PS. Barry Ornitz's response was particularly informative and educational, working through a complete design example. Thanks Barry !

It seems like the general consensus was to go for it, although the transformer is somewhat underrated for my application (part of a PS for a multi-elmac PMR7 rx). I will breadboard the voltage doubler circuit and see if the transformer melts under the load. The transformer was cheap, so I'm not too worried about it; If this runs too hot, I might try the same circuit with a pair of back-to-back Rat-shack 25.2V 2A transformers, which at 50 VA might be a little more reasonable. I'll let you know how it turns out.

73,

Mark Dittmar
AB0CW

Date: Wed, 21 Jan 1998 17:25:36 +0000
From: Sandy W5TVW <ebjr@worldnet.att.net>
Subject: Unknown "tube"..

I have some odd-ball tubes. They appear to be Xenon flash lamps? Have a "U" shaped tube and a small NE-2 sized tube next to it. These both in a clear plastic T9 bulb on an octal base. (About the size of a 6SN7GT) There is a label on the base that says: Xe 1F/2S. No manufacturer indicated. Whatzit? Anybody know.

73,

E. V. Sandy Blaize, W5TVW
"Boat Anchors collected, restored, repaired, traded and used!"
417 Ridgewood Drive
Metairie, LA., 70001

860 Hartley 'ECO' construction "on hold"**
*** Looking for a TRC-10 transceiver *****
*** Looking for an RAL receiver *****

End of glowbugs V1 #227
